

## 8. CONCLUSIONS AND RECOMMENDATIONS

### 8.1 CONCLUSIONS

The results drawn from the on-site evaluation of the Crescent Demonstration lead to the following conclusions:

- \* The on-site evaluation indicates that more than half of the WIM systems assessed have weighing accuracies outside those desired by the HELP WIM performance specification. Additionally, when comparing WIM accuracies to the manufacturers' specifications all of the WIM systems failed under at least one criterion of these specifications. However, due to the nature of the tests undertaken and the conditions of these specifications these results cannot be considered conclusive.
- \* The assessment of AVC systems indicated none of the systems evaluated achieved the desired HELP AVC specification accuracies. However, a majority of the AVC systems' accuracies were higher than those that would be reasonably expected from manual classification data collection methods.
- \* The automatic axle spacing systems evaluated, except at one site location, achieved accuracy levels desired by the HELP specifications. Comparisons of observed accuracies were undertaken with manufacturers' specifications for axle spacing measurements. These comparisons indicated that only one of the sites evaluated failed to meet the manufacturers' specifications.
- \* A cost-benefit analysis was undertaken to assess the feasibility of the Crescent system. The full potential of the equipment was not realized during the Crescent Demonstration due to a lack of utilization by weighstation and state personnel, as well as system down time. Therefore, the analysis considers the future benefits and costs of a system that will be derived over the next 20 years.

The costs utilized throughout the analysis are based on state-reported costs of equipment and services, while the benefits identified were derived from previous research. The value of each benefit identified was assessed based on the observed functional capabilities of the equipment.

Assumptions were made to derive the future net benefits or net losses from the system. Some of the major assumptions of the analysis were:

- \* A total of 460 sites would be installed by the twentieth year of the analysis. However, state and carrier benefits would begin to accrue after an initial network of 120 sites is installed.
- \* Nearly 60 percent of all carriers would be equipped with transponders by the twentieth year of the analysis. State benefits requiring the AVI capabilities would begin to accrue after 10 percent of the truck population is AVI-equipped.

- \* All sites will maintain WIM accuracies through scheduled maintenance and calibration.
- \* Observations at weighstations indicated limited integration and use of the Crescent system. During interviews with weighmasters and weighstation personnel, this limited usage was attributed to the following factors:
  - a lack of training required to operate the system and fully integrate its use into weighstation procedures;
  - limited weighmaster confidence in the reliability of the system and the accuracy of the data collected. This resulted from system failures and user reports resulting from the identification and verification of misleading data; and
  - limited management direction toward the integration of the system into normal weighstation procedures and operations by most of the states participating in the Crescent Demonstration.

However, most weighstation personnel perceived positive benefits to their operations gained from the use of an accurate, fully-operational integrated Crescent system.

- \* Observations at weighstations enabled comparison of the merits of different site layouts and equipment configurations. The layout and configuration combinations examined presented significantly different perceived levels of benefit both to the state authorities and the trucking industry.
- \* Reports from the CDO and some state authorities indicates some poor, incorrect or misplaced installations. These reduce the utility and perceived benefits to be gained from use of the Crescent system.
- \* Net benefits to both states and carriers were derived from all but two of the generic Crescent site configurations. These configurations were both mainline installations providing only partial lane coverage. The site configurations producing the greatest potential and net benefit to both carriers and states were:
  - mainline sites with WIM and AVI and full lane coverage;
  - weighstation sites with WIM and AVI in the ramp, with bypass lane, with AVI in the bypass/scale lane; and
  - mainline weight screening sites.

## **8.2 RECOMMENDATIONS**

- \* The establishment of regular schedules for maintenance and calibration of Crescent equipment is likely to increase the accuracy and reliability of data collected.
- \* More active promotion of use of the Crescent system by management within the state authorities operating the weighstations. This would expedite the integration of the system.
- \* The establishment of a continuing training program for weighstation personnel covering technical and operational aspects relating to the use of the Crescent system.
- \* The establishment of specific guidelines in relation to configurations of new weighstations or installations of Crescent equipment. In addition, specific guidelines for the installation procedures for new or replacement equipment should be developed.